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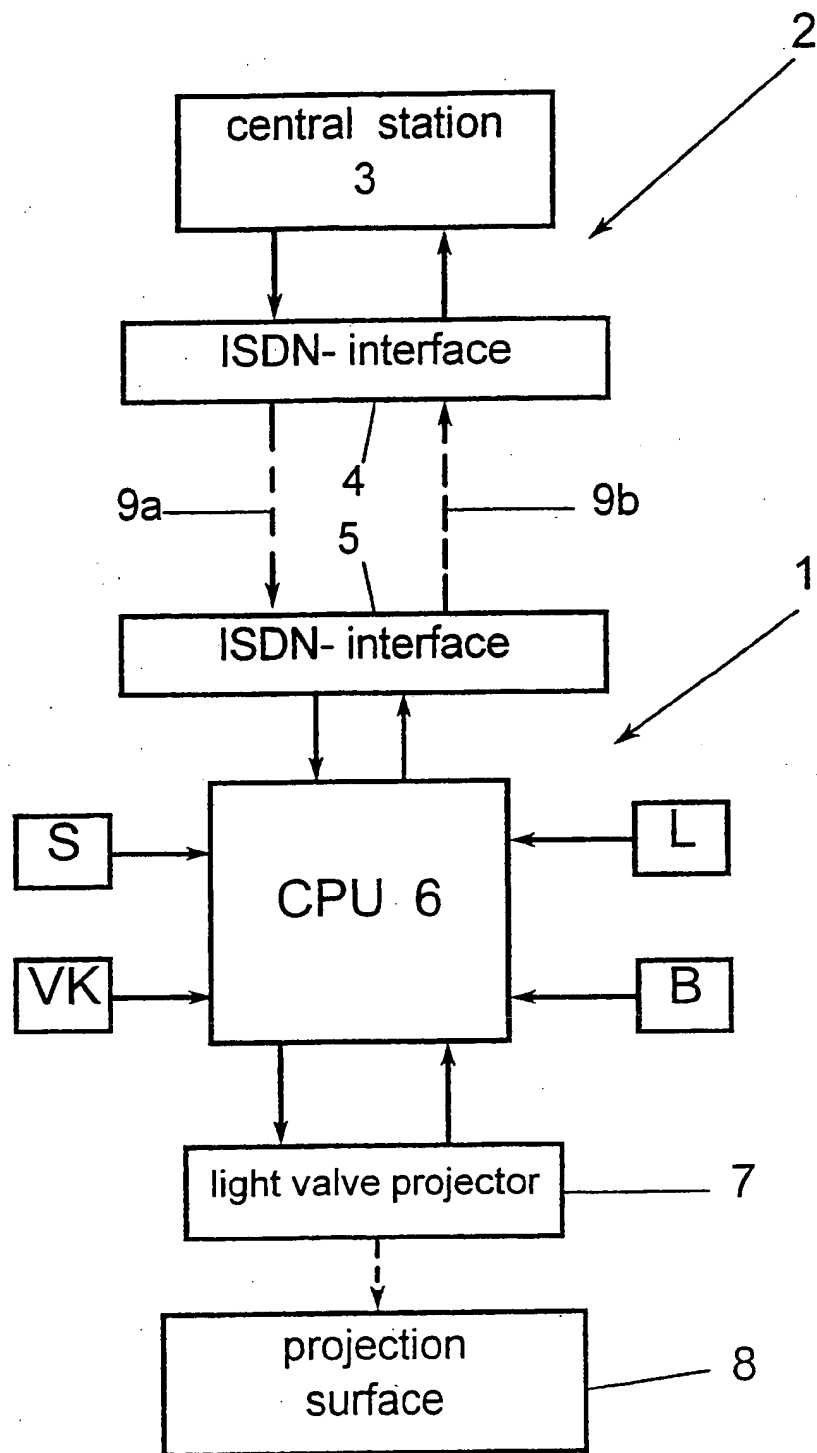
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<p>(71) Applicant(s) Infoscreen GMBH  (Incorporated in the Federal Republic of Germany)  Am Westerpark 1-3, 81 373 Munchen, Federal Republic of Germany</p> <p>(72) Inventor(s) Ingo Berger</p> <p>(74) Agent and/or Address for Service W P Thompson &amp; Co Celcon House, 289-293 High Holborn, LONDON, WC1V 7HU, United Kingdom</p>	

## (54) Video projection system

(57) A video light valve projector comprises control means which are controllable by a peripheral equipment in order to receive and store control commands, timing data and addressing data and in order to supply status reports to the peripheral equipment. The control means is connected to a detector means detecting the movement and/or sound of an object as for example an underground train/tram and responds to interrupt a currently running projection program and, if necessary, activate another specific projection program.

GB 2 288 474 A



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## Video Projection System

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This invention relates to a video projection system comprising a light valve projector and a projection surface arranged in a spaced relationship to the light valve projector in order to visibly display text, still pictures, graphs or also movable pictures on a projection surface, said light valve projector being connected to an image disc memory.

Video projection systems comprising a light valve projector and a projection surface which is arranged in spaced relationship to said light valve projector are already known. Such video projection systems are used for example if video films are to be displayed for an increased number of spectators. Such video projection systems have the advantage that the video image can be displayed on a large scale projection surface so that the video image can well be viewed from a relatively great distance.

Of course, these video projection systems can also be combined with video recording means or with image disc memory means in order to display video programs which have been stored beforehand.

It is therefore an object of the present invention to provide a video projection system of the mentioned type which cannot only be used to display visible information within public buildings or areas which is immediately visible from a far distance, but which is also capable to respond to specific environmental conditions.

Starting out from the video projection system of the type as defined above this object is solved by the invention in that

- a) said light valve projector comprises control means controllable from a peripheral equipment and capable to receive and store control commands, time data and also addressing data from said peripheral equipment through a long-range transmission medium and is also capable to transmit status information to the peripheral equipment so as to address specific memory areas within the image disc memory and for reading out the same for projecting the same at a time which can be predetermined,
- b) control means is connected to at least one detecting means for detecting a movement and/or sound of an object and which supplies a corresponding detection signal to the control means, and
- c) said control means responds to said detection signal such, that a currently displayed projection program is interrupted with the possibility to activate another specific projection program.

Thus the video projection equipment of the invention can be used for example for visually displaying on the one hand specific traffic information at public areas and on the other hand to make attentive to the drive in of a public conveyance as for example a bus, a rail vehicle etc.

Specifically the invention can be improved in that said at least one detecting means is comprised of a light barrier switch which is operable by a moving object. Such an object can be comprised for example of a moving bus, an indriving tram, underground tram or S-tram.

Moreover the at least one detecting means can be comprised of a sound detector responsive to a specific sound development of a moving object so that with this

means the approach of a public conveyance can be detected and also optically displayed.

According to an improved embodiment of the invention the peripheral equipment comprises a central computer provided at a central station which is connected to a long-range transmission line through an ISDN interface which transmission line is connected through a further ISDN interface at the range of the video projection system to the control equipment.

Furthermore according to another feature of the invention the control equipment can be connected to an independant video camera and can be made responsive to specific image signals of the video camera in order to select and activate a specific projection program.

In praxis it turned out that with the use of the video projection system for example at an underground tram area very strong stray magnetic fields are created if an underground tram is moving into the station which can basically disturb the projection operation of the video projection system. In order to eliminate this disturbing influence according to a further embodiment of the invention the said light valve projector is at least partly enclosed by a magnetically screening material as for example a MU metal. Advantageously, this magnetically screening material can have the form of a closed ring.

According to a still further feature of the invention the light valve projector together with the image disc memory, the control means and further electronical components are arranged within a common casing which is mounted at the ceiling of an underground tram station or S-tram station, the projection surface being provided at a wall at the rail area of the underground tram or S-tram so that the video projection is realized transversely across the rail area. With this arrangement of the video projection

system advantageously at least one detector means as for example the sound detector can be arranged within the area of a tunnel of the moving tram so that the approach of an underground tram will be detected and this condition can be optically displayed.

Furthermore at least one detecting means can be arranged at the stop area of the underground tram or S-tram in particular in front of the projection surface so that this detecting means can detect the presence of an underground tram within the projection range or also the absence of an underground tram within the projection range so as to either interrupt the projection operation or to continue with the same.

In order to enable a comfortable service for the video projection equipment the heavy components of the light valve projector are mounted within the common housing at a chain lifting device in order to be able to move them down and then lift them up again for service purposes.

In order to achieve a high contrast and in particular high display of the projected video images the projection surface can be comprised of a projection surface which is covered with a silver plastic layer.

Advantageously the projection surface can be arranged within an exchangeable frame so that it can be quickly exchanged in case of a defect or contermination thereof.

In the following the subject invention will be described with respect to an embodiment and with reference to the accompanying drawings the single figure of which shows a video projection system in the form of a block circuit diagram comprising features of the invention.

According to the single figure the video projection system is commonly designated by 1 whereas a central control station is designated by 2. The central control station

includes a central part 3 comprised of a computer which is connected to a data transmission medium as for example transmission lines 9a, 9b via an ISDN interface. At the equipment a further ISDN interface 5 is provided in order to transmit the data coming in from the lines 9a to the control equipment having the form of a central processor unit 6. The central processor unit CPU 6 is formed so as to receive data as well from the computer at the central station 3 as also to send status reports to the computer at the central station 3.

Within the shown embodiment the central processor unit 6 is connected to an image disc memory B having stored therein several projection programs in particular also time-table changes and further information concerning the traffic. Furthermore the central processor unit 6 is connected to a light barrier switch L and to a sound detector S, these two detecting means L and S are monitoring the movement of a public conveyance as for example of a bus, a tram, an underground tram or an S-tram. With sensing an approaching vehicle the sound detector (S) is reacting and transmits a corresponding signal to the central processor unit 6 which is then activated so as to interrupt a currently running projection program and to display a specific indication as for example: „Attention the tram is driving in“.

The control means having the form of the central processor unit 6 can also be connected to a video camera (CCD-Camera) so as to realize an optical monitoring operation at a predetermined traffic area with transmitting a corresponding status report from the CPU 6 to the central station 3.

It should be referred to the fact that the control means having the form of the central processor unit 6 can also be connected to a programmable storage device having stored therein specific software programs which can be operated or worked off in agreement with a predetermined timing plan in order to activate and display for example predetermined video programs at predetermined timings.

With an arrangement used as an example of the video projection equipment according to the invention, but which is not shown, the light valve projector together with the control means CPU 6 and also with further electronic components as for example the ISDN interface 5 are arranged within a common housing which is mounted at the ceiling of an underground tram station. The light valve projector projects a light image across the rail area onto a projection surface 8, which is provided at a wall of the stop area of the underground tram.

With such an arrangement of the video projection system the light barrier switch L is preferably arranged in front of the projection surface so as to be in a position to detect the presence of an underground tram at the stop area or the projection area and to be capable to interrupt or continue the projection program in dependence upon the presence of an underground tram.

Thus it is effectually prevented that the projection beam will be directed onto the in driving underground tram and that before the driving in of the underground tram into the respective stop station the currently displayed information program can be interrupted in time and to be able to inform the waiting passengers about the approaching tram. However, as soon as the tram is then leaving the platform the information or the entertainment program is continued.

The video projection system according to the invention can be completely programmed by means of the central computer provided at the central station 3. Additionally to the task to transmit data to the video projection system the said central computer is also capable to receive and store status reports relating for example to the image wall equipment, the projector, the control means or the video camera.

Moreover the central processor unit 6 provided within the video projection system can also be equipped with a multimedia control program which makes it possible to transmit pictures at the foreground and also text out from the large scale memory means to the light valve projector. Furthermore also individual film sequences can



be activated from the image disc memory with using the said control program which can be mixed with the computer signals by means of a corresponding electronical equipment.

In view of the fact that the video projection system is mounted at the ceiling of an underground tram station in front of the projection surface the mounting casing is so constructed that for example the particular heavy weight valver projector can be lowered down and lifted up again by means of a chain lifting means for the purpose of realizing service operations.

In view of the fact that in particular at the underground tram area for example during the indriving tram strong alternating magnetic fields are created, without a specific protection measurement extreme image displacements would result at the projection area. In order to eliminate those picture disturbances the projector is shielded with a ring of MU-metal (not shown) against strong magnetic fields.

It should be referred to the fact that with the described embodiment of a video projection system according to the invention many changes and modifications can be realized without departing from the scope of the present invention. There exists for example the possibility to arrange the video projection system not only within a closed space as for example an underground tram station, but also in a free public equipment in order to visibly display changes of a traffic program of a respective conveyance.

Moreover there exists the possibility to couple the discussed video projection system with further peripheral equipments in order to call off an information stored before hand through a slave station at predetermined traffic nodes which information is relating to changes of the traffic operation or similar.

It is also obvious for a person skilled in the art that the control means having the form of the central processor unit 6 can be connected to further control equipments

as for example sensors and video cameras in order to simultaneously collect further information at critical traffic nodes and to transmit them to the central station.

## Claims

1. A video projection system, comprising a light valve projector (7) and a projection surface (8) arranged in spaced relationship to said light valve projector (7) in order to visibly display on said projection surface (8) texts, still pictures, graphics and also moving pictures, said light valve projector being connected to an image disc memory (B), characterized in that
  - a) said light valve projector (7) comprises control means (CPU 6) controllable by means of a peripheral equipment (3), said control means being capable to receive and store control commands, timing data and addressing data transmitted by said peripheral equipment (3) through a long-range transmission medium (9a, 9b) and is capable to transmit status reports to said peripheral equipment (3) in order to address specific storage areas of said image disc memory (B) and to read them out for a projection at a predetermined time,
  - b) said control means (CPU 6) is connected to at least one detector means (LS) which detects a movement and/or a sound of an object and supplies a corresponding detection signal to said control means (CPU 6),
  - c) said control means (CPU 6) is responsive to said detection signal such, that a currently running projection program is interrupted and if necessary another specific projection program is activated.
  
2. A video projection system according to claim 1, characterized in that said at least one detector means (L) is comprised of a light barrier switch which is actuatable by means of a moving object.
  
3. A video projection system according to claim 1, characterized in that said at least one detector means (S) comprises a sound detector responsive to a specific sound generation of a moving object.

4. A video projection system according to one of the claims 1 to 3, characterized in that said moving object is comprised of a vehicle.
5. A video projection system according to claim 4, characterized in that said vehicle is a rail track vehicle.
6. A video projection system according to claim 5, characterized in that said rail track vehicle is an underground tram or S-tram.
7. A video projection system according to claim 1, characterized in that said peripheral equipment (3) comprises a computer provided within a central station (3) which is connected to a long-range transmission line (9a, 9b) through an ISDN interface (4), which transmission line is connected to said control means (CPU 6) through a further ISDN interface (5).
8. A video projection system according to claim 1, characterized in that said control means (CPU 6) is connected to a video camera (VK) and is responsive to specific image signals of said video camera (VK) in order to select and activate a specific projection program.
9. A video projection system according to claim 1, characterized in that said light valve projector (7) is at least partly enclosed by a magnetic screening material.
10. A video projection system according to one of the claims 1 to 9, characterized in that said light valve projector (7) together with the image disc memory (B), the control means (CPU 6) and further electronical components (5) are arranged within a common housing which is mounted at the ceiling of an underground tram station or S-tram station, in that said projection surface (8) is arranged at a wall provided within the rail area of an underground tram station or S-tram station in such a way that the video projection is realized transversely across the rail area.

11. A video projection system according to one of the claims 1, 2, 3 or 10, characterized in that said at least one detector means (LS) is arranged within the range of a tram moving in tunnel.

12. A video projection system according to one of the claims 1, 2,3 or 10, characterized in that said at least one detector means (L) is arranged at the stop area of the underground tram or S-tram, in particular in front of the projection surface (8).

13. A video projection system according to claim 10, characterized in that at least the heavy components of the light valve projector (7) provided within the common casing, are mounted at a chain lifting means in order to lower them down from the ceiling and lift them up again for service purposes.

14. A video projection system according to claim 1, characterized in that said projection surface (8) is comprised of a projection surface coated with a silver plastic layer.

15. A video projection system according to claim 14, characterized in that said projection surface (8) is arranged within an exchangeable frame

16. A video projection system substantially as hereinbefore described with reference to the accompanying drawing.

12

**Patents Act 1977**  
**Examiner's report to the Comptroller under Section 17**  
**(The Search report)**

Application number  
 GB 9505752.7

**Relevant Technical Fields**

- (i) UK Cl (Ed.N)      G3N (NGCA, NGCA5)  
 (ii) Int Cl (Ed.6)      H04N (5/74, 9/31)

Search Examiner  
 MR D A SIMPSON

Date of completion of Search  
 15 MAY 1995

**Databases (see below)**

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii) WPI

Documents considered relevant following a search in respect of Claims :-  
 1 TO 16

**Categories of documents**

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| <p><b>X:</b> Document indicating lack of novelty or of inventive step.</p> <p><b>Y:</b> Document indicating lack of inventive step if combined with one or more other documents of the same category.</p> <p><b>A:</b> Document indicating technological background and/or state of the art.</p> | <p><b>P:</b> Document published on or after the declared priority date but before the filing date of the present application.</p> <p><b>E:</b> Patent document published on or after, but with priority date earlier than, the filing date of the present application.</p> <p><b>&amp;:</b> Member of the same patent family; corresponding document.</p> |
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Category	Identity of document and relevant passages	Relevant to claim(s)
	NONE FOUND	

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